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**US HL-LHC Accelerator Upgrade Project**

**MQXFA Electrical QA**

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**Revision History**

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| **Revision** | **Date** | **Section No.** | **Revision Description** |
| v0 | 6/27/17 | All | Initial Release |
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# Comments

* **Hipot tests**:
* Power the component listed first, keep not tested components floating.
* Set the maximum leakage current threshold to **1 μA** (10 μA when 1 μA does not work). The maximum leakage current must not be exceeded neither during Ramp up nor at Plateau (30 s Plateau).

# Test parameters

* Magnet inductance (L&Q) measurements at 20 Hz, 100 Hz and 1000 Hz
* Magnet resistance (R) measurements at 1 A.
* Impulse tests with direct polarity (High OL – Ground IL) at 500 V, 1000 V, 1500 V, 2000 V and then with 100 V steps up to 2500 V, 2 test pulses applied at each step.
* Impulse tests with reversed polarity (High IL – Ground OL) at 500 V, 1000 V, 1500 V, 2000 V and then with 100 V steps up to 2500 V, 2 test pulses applied at each step.

# Tests at room temperature, magnet not connected to the header assembly yet

Coils-to-Structure (Ground) Hipot 3700 V

Heaters-to-Coils (Ground) Hipot 3000 V

Heaters-to-Structure (Ground) Hipot 2500 V

Impulse Test (Direct and Reverse) 2500 V

# Tests after cool-down to 1.9 K

Coils-to-Structure (Ground) Hipot 1800 V

Heaters-to-Coils (Ground) Hipot 2300 V

Heaters-to-Structure (Ground) Hipot 1000 V

***Attachment***

*Here the final checks and tests done during single Coil Fabrication (see USHiLumi DocDB # 521)*

 *∙Coil RLQ (20 Hz, 100 Hz, 1 kHz)*

*∙Continuity checks:*

*coil-to-structure,*

*heaters-to-structure,*

*coil-to-RE saddles,*

*coil-to-LE splice blocks,*

*coil-to-heaters,*

*saddle-to-saddle,*

*heaters-to-saddles,*

*coil to pole,*

*pole segm to pole segm*

*∙Voltage tap & Heater R*

*∙Hipots:*

*QH to Coil 3200 V*

*Coil to Pole 0500 V*

*Coil to Endshoes (all) 1000 V*

*QH IL to Endshoes IL 2500 V*

*QH OL to Endshoes OL 2500 V*

*Endshoes IL to Endshoes OL 1000 V*

 *∙Impulse tests (Direct and Reverse)*